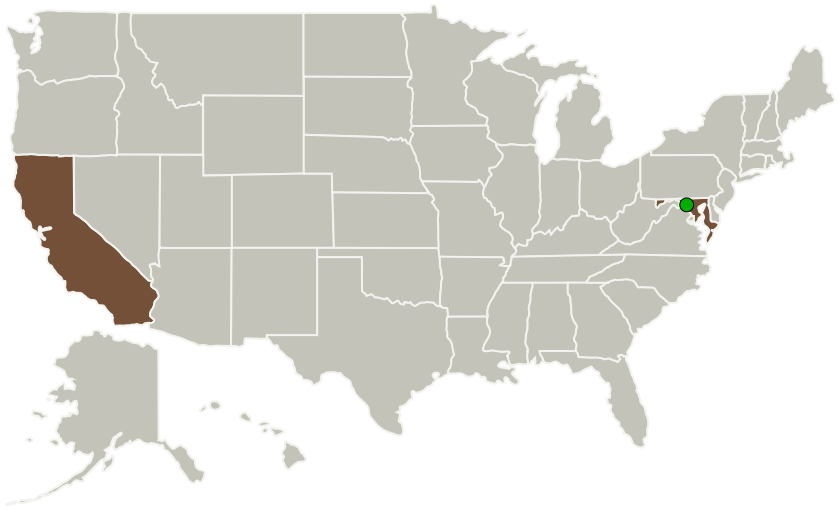
Frequency Agile Mid-IR Source for Planetary Exploration, Phase I

Completed Technology Project (2010 - 2010)

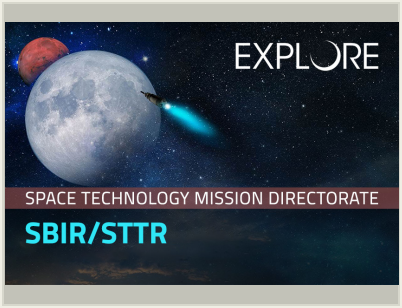
Project Introduction

The Small Business Innovative Research Phase I proposal seeks to develop a compact, room-temperature widely tunable middle infrared laser source that will be ideal for detecting methane, it's isotopes and related species using ultrasensitive absorption spectroscopies. The broad tuning ability of the laser will also enable the detection of multiple gas-phase trace species in planetary atmospheres with high selectivity. The laser source will be engineered to be ideally suited for use with high finesse multipass cells, including cavity-ringdown cells. During Phase I, a spectral region of tens of nanometers near 3.3 μm will be demonstrated, which overlaps the spectral absorption features of methane, 13CH4, and formaldehyde. When combined with high sensitivity absorption methods, the laser system will enable these species to be detected at concentrations of less than 1 ppbv in the Martian atmosphere.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Novawave Technologies	Lead Organization	Industry	Redwood City, California
Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland



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Primary U.S. Work Locations	
California	Maryland

Project Transitions

January 2010: Project Start

September 2010: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139020)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Novawave Technologies

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

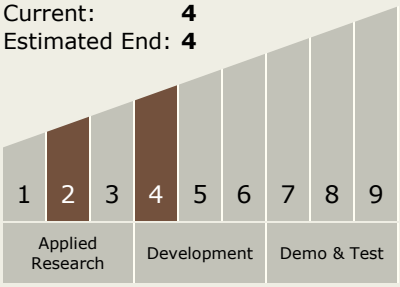
Carlos Torrez

Principal Investigator:

Hansjurg Jost

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.5 Lasers

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System